(19) Japanese Patent Office (JP)

(12) Publication of Unexamined Patent Application (A)

(11) Disclosure Number: Unexamined Application H9-87405 (H9-87405)

(43) Date of Disclosure: March 31, 1997

(51) Int. Cl.[6]	Identification Code	FI	Indicator of Technology
C08J 7/04 CES		C08J 7/04	CES M
A61F 13/15		A61F13/18	370

Examination Request Status: Not Yet Requested. No. of Claims: 3, FD (4 pages total)

(21) Filing Number: Patent Application No. H7-263701

(22) Date of Application: September 19, 1995 (09.19.1995)

(71) Applicant: 000005407
Honshu Seishi K.K.
5-12-8 Ginza, Chuo-ku, Tokyo

(72) Inventor: Yoshio HIROTSU
c/o Honshu Seishi Shiga Factory,
65 Hirayama Asakuni,
Kosei-cho, Koka-gun, Shiga Prefecture

(72) Inventor: Toshimasa KATO
c/o Honshu Seishi Shiga Factory,
65 Hirayama Asakuni,
Kosei-cho, Koka-gun, Shiga Prefecture

(72) Inventor: Katsuhiko MORIMOTO
c/o Honshu Seishi Shiga Factory,
65 Hirayama Asakuni,
Kosei-cho, Koka-gun, Shiga Prefecture

(74) Agent: Masayuki ASAKURA, Attorney (and 1 other)

(54) [Title of the Invention] Film for Individually Packaged Sanitary Napkins

(57) [Abstract]

[Problem]

To provide excellent heat resistance as well as a thinness and flexibility.

[Resolution Means]

A polypropylene film with a silicone process on at least one side, the tensile elastic modulus of the silicone processed polypropylene film is 25kgf/mm^2 in both the longitudinal and transverse directions or less, and the DSC measured melting temperature is 130°C or higher.

[Scope of the Patent Claims]

[Claim 1]

A film for individually packaging sanitary napkins, comprising a polypropylene film with a silicone process on at least one side, the tensile elastic modulus of the silicone processed polypropylene film being 25kgf/mm^2 or less in both the longitudinal and transverse directions, and the DSC-measured melting temperature being 130°C or higher.

[Claim 2]

The film for individually packaging sanitary napkins, according to claim 1, wherein the thickness of the polypropylene film is in the range 15 to 50μm.

[Claim 3]

The film for individually packaging sanitary napkins according to claim 1 or claim 2, wherein pigment is added to the polypropylene film with a silicone process to give an opacity of 40% or higher.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention]

The present invention relates to film for individually packaging sanitary napkins.

[0002]

[Conventional Technology]

Conventionally, thin, flexible, low-density polypropylene film is used for individually packaging sanitary napkins. This is to ensure that there is as little sound as possible when opening the packaging.

[0003]

Furthermore, packaging provided with a releasing agent on the inner periphery is known. This is to make it unnecessary to use release coated paper on the tacky layer

provided on the rear surface of the napkin. An example of this type of packaging is disclosed in Japanese Utility Model No. H4-46738, which describes a packaging for sanitary napkins in which a releasing agent layer is formed on the inner peripheral surface of the packaging that is in contact with the tacky layer provided on the rear surface of the napkin.

[0004]

However, thin, flexible, low-density polypropylene film cannot be used as the film for this type of packaging. This is because in order to form the releasing agent layer on one side of the film corresponding to the inner peripheral surface of the packaging, when applying and hardening silicone or similar releasing agent, the releasing agent hardening temperature is 140 to 160°C. Also, the tacky material layer is formed by applying hot-melt tacky material on the top surface of the releasing agent layer, but the application temperature of this hot-melt tacky material is 140°C or higher. Polypropylene film will melt or deform significantly if placed in these temperatures.

[0005]

Therefore, in Japanese Unexamined Patent Application No. S61-122861, a film having a multi-layer structure of low-melting-point film and high-melting-point film is disclosed as a film for packaging. The low-melting-point film material can be polyethylene, and the high-melting-point film material can be polypropylene, or ionomer resin.

[0006]

Also, Japanese Utility Model No. H3-184543 discloses a film for packaging that uses ultraviolet hardening silicone resin, which hardens under low temperature, on the surface of the film.

[0007]

[Problem to be Solved by the Invention]

The film for packaging, according to Japanese Unexamined Patent Application No. S61-122861, has a multi-layer structure, so the manufacturing process is complex, making high manufacturing costs a problem.

[0008]

Also, there is the problem that the methods of sealing are limited for packaging in which low-melting-point film is provided on the outer peripheral surface, and high-melting-point film is provided on the inner peripheral surface.

[0009]

On the other hand, the packaging film, according to Japanese Utility Model No. H3-184543, requires an ultraviolet radiation device, and the hardening time is long compared with the conventional heating method, which can be problematic.

[0010]

Furthermore, even if the temperature rise is avoided in the process of hardening the silicone resin, if the tacky material layer is formed by applying hot-melt tacky material on the top surface of the releasing agent layer, it is not possible to avoid raising the temperature of the packaging film. Therefore, there is still the problem with significant deformation or melting of the packaging film.

[0011]

With this in mind, it is an object of the present invention to provide a packaging film that can be peeled, that has excellent heat resistance as well as thinness and flexibility.

[0012]

[Summary of the Invention]

The film for individually packaging sanitary napkins according to the present invention is a polypropylene film with a silicone process on at least one side, the tensile elastic modulus of the silicone processed polypropylene film is 25kgf/mm^2 or less, and the DSC measured melting temperature is 130°C or higher.

[0013]

If the tensile elastic modulus is 25kgf/mm^2 or higher, there will be insufficient flexibility and sound will be made when opening the package.

[0014]

When the DSC measured melting temperature is 130°C or less, in the silicone resin hardening process and in the process of applying the hot-melt tacky material to the top surface of the releasing agent layer to form the tacky material layer, the packaging film will melt or deform significantly.

[0015]

The polypropylene film is obtained by forming the film with a mixture of, for example, 20 to 40wt% polypropylene or propylene copolymer, 5 to 20wt% ethylene propylene copolymer (containing 55wt% or more ethylene), and 40 to 75wt% ethylene propylene copolymer (containing 20 to 40wt% or more ethylene).

[0016]

Furthermore, instead of the ethylene propylene copolymer (containing 55wt% or more ethylene), ethylene propylene α-olefin copolymer may be used. Also, instead of

ethylene propylene copolymer (containing 20 to 40wt% or more ethylene), ethylene propylene α-olefin copolymer or ethylene α-olefin copolymer may be used.

[0017]

Furthermore, the thickness of the polypropylene film according to the present invention is preferably in the range 15 to 50μm. If the thickness is smaller than 15μm, the strength is insufficient, so during silicone processing the film might tear, or stretch in the longitudinal direction and shrink in the transverse direction. Also, if the thickness is 50μm or larger, the flexibility is poor.

[0018]

The polypropylene film applied to the film for individually packaging sanitary napkins according to the present invention has pigment added to give an opacity of preferably 40% or higher. This is because if the opacity is less than 40%, the napkin contained in the packaging can be seen from outside.

[0019]

The above pigment may be titanium oxide, talc, kaolin, or the like. In the case of titanium oxide, the quantity is preferably 2wt% or more relative to 100wt% of the polypropylene film materials.

[0020]

[Examples]

(Example 1)

3wt% of titanium oxide and 0.2wt% monoglyceride stearate were mixed to 100wt% polypropylene elastomer KS-025P (manufactured by Himont, Inc.) to prevent static electricity, were melted at 150°C, and were extruded using a pipe-shaped die, to obtain 25μm thick polypropylene film.

[0021]

A corona discharge process was applied to the polypropylene film so that the wetting tension became 40 dyne. Silicone (KS774 made by Shin-Etsu Chemical Co., Ltd.) was applied at the rate 0.3g/m^2, to obtain the film for individually packaging sanitary napkins.

[0022]

The tensile elastic modulus of this packaging film was 20kgf/mm^2 in both the longitudinal and transverse directions, the DSC measured melting temperature was 158°C, and the opacity was 54%.

[0023]

The peeling strength of the packaging film was 30g/50mm, which was good. Also, when hot-melt tacky material (S-dine 8620G made by Sekisui Chemical Co., Ltd.)

at 180°C was applied at about 3mm width using a test gun, wrinkles, shrinkage, and the like did not occur in the packaging film. Also, when the packaging film was torn or crumpled, the noise was small, and the film had a soft feel.

[0024]

(Example 2)

Instead of the polypropylene elastomer KS-025P (manufactured by Himont, Inc.) of Example 1, polypropylene elastomer KS-052P (manufactured by Himont, Inc.) was used, and the sanitary napkin packaging film was obtained by the same method as Example 1.

[0025]

The tensile elastic modulus of this packaging film was 13kgf/mm^2 in both the longitudinal and transverse directions, the DSC measured melting temperature was 141°C, and the opacity was 58%.

[0026]

The peeling strength of the packaging film was 30g/50mm, which was good. Also, when hot melt tacky material (S-dine 8620G made by Sekisui Chemical Co., Ltd.) at 180°C was applied at about 3mm width using a test gun, wrinkles, shrinkage, and the like did not occur in the packaging film. Also, when the packaging film was torn or crumpled, the noise was small, and the film had a soft feel.

[0027]

(Comparison Example 1)

3wt% titanium oxide, 14wt% calcium carbonate, and 0.2wt% monoglyceride stearate were mixed to 100wt% low density polyethylene XM074-1(made by Showa Denko K.K.) to prevent static electricity, were melted at 170°C, and were extruded using a pipe-shaped die, to obtain 25μm thick polyethylene film.

[0028]

This polyethylene film was given a silicone process the same as Examples 1, 2, to obtain the sanitary napkin packaging film.

[0029]

The tensile elastic modulus of this packaging film was 15kgf/mm^2 in both the longitudinal and transverse directions, the DSC measured melting temperature was 112°C, and the opacity was 50%.

[0030]

The peeling strength of the packaging film was 30g/50mm, which was good. However, when hot melt tacky material (S-dine 8620G made by Sekisui Chemical Co., Ltd.) at 180°C was applied at about 3mm width using a test gun, wrinkles, shrinkage,

and the like occurred in the packaging film. Also, when the packaging film was torn or crumpled, the noise was small, and the film had a soft feel.

[0031]

(Comparison Example 2)

,3wt% titanium oxide, 14wt% calcium carbonate, and 0.2wt% monoglyceride stearate were mixed to 70wt% low density polyethylene XM074-1 (made by Showa Denko K.K.), and 30wt% high density polyethylene 5050 (made by Showa Denko K.K.) to prevent static electricity, were melted at 190°C, and were extruded using a pipe-shaped die, to obtain 25μm thick polyethylene film.

[0032]

This polyethylene film was given a silicone process the same as Examples 1, 2, to obtain the sanitary napkin packaging film.

[0033]

The tensile elastic modulus of this packaging film was 34kgf/mm^2 in both the longitudinal and transverse directions, the DSC measured melting temperature was 131°C, and the opacity was 50%.

[0034]

The peeling strength of the packaging film was 28g/50mm, which was good. Also, when hot-melt tacky material (S-dine 8620G made by Sekisui Chemical Co., Ltd.) at 180°C was applied at about 3mm width using a test gun, wrinkles, shrinkage, and the like did not occur in the packaging film. However, the packaging film had a stiff feel, when the packaging film was torn or crumpled, the noise was loud.

[0035]

The tensile elastic modulus for each of the above examples and comparison examples was measured in accordance with JIS-K7127.

[0036]

Also, the opacity was measured using a Photovolt digital colorimeter (TC-6D made by Tokyo Denshoku Co., Ltd.).

[0037]

Also, the DSC measured melting temperature was obtained by heating at a temperature rise rate of 10°C/min. up to 180°C, holding for 10 minutes, then cooling at the rate 10°C/min. to 40°C, then increasing the temperature at the rate 10°C/min. up to 180°C, and the highest melting peak temperature of the melting peak temperatures was taken to be the DSC measured melting temperature.

[0038]

Also, the peeling strength was measured by applying tacky material (BPS-8170 made by Toyo Ink Mfg. Co., Ltd.) at a thickness of 100μm (including solvent) to the silicone processed surface of the film, drying for 3 minutes in a 100°C environment, then fixing 50g/m^2 high quality paper to the surface of the tacky material, and placing it for 24 hours in a 20°C 65% RH environment, to obtain a laminate of the packaging film and the high quality paper. The peeling resistance (U peel) between the silicone processed surface of the laminate and the tacky material layer was measured at the tension rate of 0.3m/min.

[0039]

[Effect of the Invention]

The film for individually packaging sanitary napkins according to the present invention has a tensile elastic modulus in both the longitudinal and transverse directions of 25kgf/mm^2, the DSC-measured melting temperature is 130°C or higher, so the heat resistance is excellent while being thin and flexible, so silicone processing and the like can be carried out without melting or significant deformation.

[0040]

Also, the film for individually packaging sanitary napkins according to the present invention has a thickness in the range 15 to 50μm, so a feel with excellent flexibility can be obtained while maintaining the necessary strength.

[0041]

Also, the film for individually packaging sanitary napkins according to the present invention has an opacity of 40% or more, so it is possible to make it impossible to see the napkin contained in the package from the outside.